AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 8, as follows:

Current inertial sensing systems such as accelerometers, gravimeters and inclinometers are based on the relative displacement between an inertial mass and the base of the instrument when the ~~said~~ base is subject to an external perturbation (vibration, modification of the "g" level, angle); and gyroscopes, which are another kind of inertial sensing system, are made of an inertial mass which is rotated about one of its ~~axis~~ axes of inertia and the measurement ~~principle~~ relies on the relative movement between the ~~said~~ axis and the base of the instrument, or on the force generated by the ~~said~~ axis on the base of the instrument, when the ~~said~~ base is subject to an external movement.

Please amend the paragraph beginning at page 1, line 20, as follows:

Indeed this friction is responsible ~~of imprecision in the~~ for imprecise measurement, of wear between the mechanical parts in contact, and it might also lead to failure due to mechanical fatigue.

Please amend the paragraph beginning at page 3, line 14, as follows:

The present invention relates to a sensor ~~as defined in claim 1~~ and to a bi-directional actuator ~~as defined in claim 11~~.

~~Preferred embodiments are defined in the dependent claims.~~

Please amend the paragraph beginning at page 4, line 9 as follows:

As for the said common electrode, if, for instance, ~~we take~~ a disc shaped diamagnetic material is considered, the diamagnetic material will be inserted inside a non-ferromagnetic ring shaped metal or a ring shaped electret (that can be pre-charged by electrostatic charges). The association of the diamagnetic disc and the ring shaped metal

(or ring shaped electret) constitutes the common electrode of the said electrostatic actuators and also constitutes the inertial mass used in this invention.

Please amend the paragraph beginning at page 4, line 24 as follows:

In a preferred embodiment the invention comprises a feed-back loop incorporating the electrostatic actuators, the non contact position sensors, a signal conditioning unit for the sensors, a ~~High~~ high voltage power supply, and a controller which computes the amount of voltage to apply to the independent electrodes of the said electrostatic actuators in order to maintain the inertial mass at a predefined position. Moreover the invention may comprise a signal processing unit that can be the same unit used for the controller or a separate unit.

Please amend the paragraph beginning at page 5, line 1, as follows:

When a relative movement of the base occurs (due to an acceleration, a tilt, etc...) the controller ~~apply~~ applies to the electrodes a voltage that is proportional to the disturbance (acceleration, angle).

Please amend the paragraph beginning at page 5, line 10, as follows:

In addition, if a disc (or cylindrical) shape diamagnetic element is used with a ring (or cylindrical) shape electret (the electret can be pre-charged), and if each of the three (at least) electrodes facing the electret is made of, at least, three alternating comb electrodes, then a motor ~~function~~ can be implemented in order to spin the inertial mass about its main inertial axis.

Please amend the paragraph beginning at page 9, line 17, as follows:

- and a digital controller ~~5~~12 that generates the required voltages (**FIG. 2** and **FIG. 3**) to the 2 pairs of electrodes **11** (or **4** + **3**) in order to maintain (thanks to the generated

electrostatic forces **13)** the diamagnetic disc **1** at a predefined position when it is subjected to motion (due to shaking in case of a seismic sensor, or due to angular displacement in case of an X-Y tiltmeter, or due to a variation of g in the case of a gravimeter).

Please amend the paragraph beginning at page 10, line 13, as follows:

If a feedback loop along a direction Z, orthogonal to the X-Y ~~plan~~ plane of the magnet array, incorporating a Z electrostatic actuator, as well as, at least, one Z position sensor (facing one of the face of the inertial disc), is added to the inertial sensing system embodiment described previously, then the whole system becomes an X-Y-Z actuator and the high voltage amplifier needs an additional input and an additional output. The Z actuator consists of at least one electrostatic actuator made of the diamagnetic disc **1** and the array of magnets **2** on which a high voltage is applied in order to attract the diamagnetic disc.

Please amend the paragraph beginning at page 10, line 31, as follows:

The preferred arrangement for inertial sensing systems, or for bi-directional or tri-directional actuators, is a 2D (such as Halbach 2D or opposite 2D) array of magnets ~~in the configuration of **FIG. 9**~~.

Please amend the paragraph beginning at page 11, line 25, as follows:

Except for the use of this inertial sensor as a gyroscope, the shape of the inertial mass **1+3** does not have to be a disc nor a cylinder; ~~It~~ it can be a parallelepiped, a triangle or a square for instance.

Please amend the paragraph beginning at page 12, line 4, as follows:

- Some additional plain electrodes **4'** (cf.**FIG.12**), ~~pointing~~ facing towards the inner surface of the electret crown can be added to better stabilize the axial movements of the inertial mass.

Please amend the paragraph beginning at page 13, line 21, as follows:

The precision of the measurements will mainly depend on the electronics used (resolution and sensitivity of the sensor, number of bits of the AD converters, number of bits used in the controller, etc...);

and if ~~we apply the void~~ a void is utilized inside the system, ~~we~~ it can also enhance the precision of the measurements.